

Remarks

Reconsideration is requested in view of the preceding amendments and the following remarks. By this Amendment, claims 1-2, 4, 7, 9, 11-12, and 14 are amended, claims 6, 13, and 15-18 are cancelled without prejudice, and new claims 19-22 are submitted for consideration. Support for the claim amendments can be found in the specification at, for example, page 20, first full paragraph, and page 31, Table 2.

Arrangement of the Specification

No particular correction of the specification was requested by the Office action. If any particular amendments are believed necessary, Applicants request identification of such amendments. Applicants note that this application is a national stage of International Application PCT/CA2004/097601 and complies with Patent Cooperation Treaty Article 27 and Rules 5-11 concerning the form of the application, and thus no additional form requirements are believed necessary.

Claim Objections

Claim 2 is amended to recite “real-time monitoring” and is now properly noted as Currently Amended. In view of this Amendment, withdrawal of the objection to claim 2 is requested.

Rejections under 35 U.S.C. § 102 in View of Brown

Claims 1-2, 6, 9-12, and 15 stand rejected as anticipated by Brown et al., U.S. Patent 5,557,686. As admitted by the Office action, Brown does not disclose a data interception unit

configured to identify data from a mouse as one of movement, drag and drop, point and click, and silence. In view of the amendments to independent claims 1 and 9 to include features pertaining to collection of movement data associated with a mouse, withdrawal of this rejection is requested.

Rejections under 35 U.S.C. § 103 in View of Akiyama and Brown

Claims 4-5, 7-8, 13-14, and 17-18 stand rejected as obvious in view of a combination of Brown and Akiyama et al., U.S. Patent 5,768,387 (hereinafter “Akiyama”). This rejection is traversed. Upon entry of this Amendment, independent claims 1 and 9 recite features related to those of dependent claims 4-5, 7-8 and 13-14, 17-18. Accordingly, the patentability of claims 1 and 9 is addressed first.

Amended independent claim 1 recites, in part:

A behavioral biometrics-based user verification system for use with a mouse input device, said system comprising:

a data interception unit for receiving inputs from a user, wherein the data interception unit is configured to passively collect mouse data generated in response to the user;

a behavior analysis unit operatively coupled to said data interception unit to receive the passively collected mouse data;

a behavior comparison unit operatively coupled to said behavior analysis unit, wherein said system dynamically monitors and passively collects behavioral biometric information, and translates said behavioral biometrics information into representative data, stores and compares different results, and outputs a user identity result.

Akiyama does not disclose such a system. According to Akiyama, tracks of mouse movements are detected in response to presentation of a menu screen or a display of previously established points:

In the case where a mouse is used, a menu screen is caused to be displayed such as that shown in FIG. 12, and the tracks of the mouse movements on the menu screen may be detected, and the characteristics information may be a function that shows the path of these tracks (refer to FIG. 8).

Also, as shown in FIG. 9, a method may also be used whereby the times of the mouse click on a menu screen (two-dimensional axis) and the coordinate values at the time of that click may be detected, and, based on this dual information, a function is generated.

Additionally, as shown in FIG. 10, a method may also be used whereby multiple specific points are previously established on a menu screen (two-dimensional axis), and based on the time it takes to move to each specified point and the coordinate values of each specified point, a function is generated.

(Akiyama, col. 11, lines 42-57). Akiyama's Figs. 8-10 merely show mouse movements (see Figs. 8-9) defined by mouse clicks in response to a display of a menu screen (see Fig. 12) or to a display of previously established points (see Fig. 10). Thus, Akiyama discloses actively collected mouse data generated in response to displayed images such as menus or points. Akiyama fails to disclose passively collected mouse data as recited in amended claim 1. As noted in the specification of the present application, user actions can be detected by "[r]unning a process in the background that hooks all mouse actions transparently." See page 20, first full paragraph. Thus, data is collected without presentation of special menus or special points. Because the Brown/Akiyama combination fail to teach all the features of claim 1, claim 1 and dependent claims 2-5, 7-8, and 19-20 are properly allowable.

Dependent claims 2-5, 7-8, and 19-20 recite additional features and combinations of features that are not found in the cited references. For example, amended claim 4 further recites that "said data interception unit is configured to identify data based on mouse movement between first and second locations, wherein movement between the first and second locations is not associated with a mouse click." The Brown/Akiyama does not teach such a data interception unit. According to Akiyama, times of mouse clicks or coordinate values associated with mouse clicks are used. See Akiyama, col. 11, lines 42-57. In addition, Akiyama's mouse trajectories

shown in Figs. 8-10 all involve at least one mouse click that is used to establish mouse data. In contrast, claim 4 recites receiving “data based on mouse movement between first and second locations, wherein movement between the first and second locations is not associated with a mouse click.” Because the Brown/Akiyama combination fails to teach all the features of claim 4, claim 4 is properly allowable over this combination.

In another example, new dependent claim 20 further recites:

wherein the behavior comparison unit is configured to produce the user identity result based on mouse movement speed compared to traveled distance, average speed per direction of movement, a distribution of movement directions, average speed with respect to action type, a distribution of actions, a distribution of traveled distance, and a distribution of movement elapsed time.

The Brown/Akiyama combination fails to teach a behavior comparison unit configured to produce a user identity result in this manner, and claim 20 is properly allowable over this combination.

Amended independent claim 9 recites:

A method of characterizing a user comprising the steps of:
moving a computer mouse,
dynamically monitoring and passively collecting behavioral biometric information from the mouse,
processing said passively collected behavioral biometric information, and
developing a signature for a user based on the processed information.

Akiyama does not disclose such a method. As noted above, Akiyama discloses detecting mouse movements in response to presentation of a menu screen or a display of previously established points. Akiyama does not teach or suggest “passively collected behavioral biometric information,” “processing said passively collected behavioral biometric information,” and “developing a signature for a user based on the processed information” as recited in claim 9. Thus, the Brown/Akiyama combination fails to teach all the features of claim 9. For at least this reason, claim 9 and dependent claims 10-12, 14, and 21-22 are properly allowable.

Dependent claims 10-12, 14, and 21-22 recite additional patentable combinations of features. For example, new dependent claim 22 further recites:

the passively collected behavioral biometric data is based on mouse movement between first and second locations, wherein movement between the first and second locations is not associated with a mouse click.

The Brown/Akiyama does not teach collecting such data. According to Akiyama, times of mouse clicks or coordinate values associated with mouse clicks are used. See Akiyama, col. 11, lines 42-57. In addition, Akiyama's mouse trajectories shown in Figs. 8-10 all involve at least one mouse click that is used to establish mouse data. In contrast, claim 22 recites receiving "data based on mouse movement between first and second locations, wherein movement between the first and second locations is not associated with a mouse click." Because the Brown/Akiyama combination fails to teach all the features of claim 22, claim 22 is properly allowable over this combination.

As another example, new dependent claim 21 further recites:

wherein the signature for the user is developed based on mouse movement speed compared to traveled distance, average speed per direction of movement, distribution of movement directions, average speed with respect to action type, a distribution a of actions, a distribution of traveled distance, and a distribution of movement elapsed time.

The Brown/Akiyama combination fails to teach developing a signature in this manner, and claim 20 is properly allowable over this combination.

Rejections under 35 U.S.C. § 103 in View of Brown and Boebert

Claim 3 stands rejected as obvious in view of a combination of Brown and Boebert et al., U.S. Patent 5,596,718. This rejection is traversed. Claim 3 is properly allowable as dependent from allowable claim 1, and withdrawal of this rejection is requested.

Conclusion


In view of the preceding, all pending claims are in condition for allowance and action to such end is respectfully requested. If any issues remain or the Examiner believes a telephonic interview would be helpful, the Examiner is requested to telephone the undersigned.

Respectfully submitted,

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